



FRD ACTIVITIES REPORT

April - June 2013



RESEARCH PROGRAMS

Birch Creek Valley Wind Flow Study

Phase 1 of the Birch Creek Valley Study concluded in June. It was begun in December, 2012 and was focused primarily on the interactions between wind flows in the Birch Creek Valley, a large intermontane valley with relief of several thousand feet, and the large scale wind flows of the adjoining Snake River Plain with its prominent up and down plain diurnal flows. The study was conducted on the Idaho National Laboratory (INL) property and on INL-leased property. Only FRD was involved with these measurements.

Phase 2 of the Birch Creek Valley Study began in June. The focus of this larger effort was to acquire more detailed measurement of wind flows within the Birch Creek Valley itself. The study also involves other participants besides FRD using federal lands adjacent to the INL. FRD completed the relocation of the radar profiler, 3 sodars, and two sonic anemometers into the valley from June 10-12. The USFS Fire Science Laboratory deployed 75 wind sensors and a sodar from June 11-13. Washington State University deployed two flux station towers including instrumentation for additional turbulence measurements from June 20-23. All deployments are now complete and everything is operational. Some wind events have already been observed in Phase 2 that highlight some large scale flow features in complex terrain. (dennis.finn@noaa.gov)

Transport and Dispersion Modeling

The review of the HYSPLIT Radiological Software Quality Assurance plan (HYRad SQA) and its gap analysis required for inclusion in the DOE Emergency Managers Issues Special Interest Group (EMI SIG) Subcommittee on Consequence Assessment and Protective Actions (SCAPA) Consequence Assessment Model Toolbox is still pending. It was submitted to SCAPA last quarter. (dennis.finn@noaa.gov)

Project Sagebrush

Phase 1 field deployment for Project Sagebrush is scheduled for the first two weeks of October 2013 at the Idaho National Laboratory. Preparation of the necessary equipment has been and will continue to be a major activity until then. Tubing is being replaced in the existing 135 air samplers and an additional 14 samplers are being constructed. Tests on the tubing that will be used in the new samplers were started the first week of June and are continuing. Supplies for the air sampling system and the near real time tracer analyzers are being ordered. One analyzer has been shipped to the University of Tennessee Space Institute (UTSI) for integration into a Cessna 210 aircraft for airborne sampling. Conditioning and necessary repairs on the near real-time analyzers will begin about August 1 and continue to until the project starts.

With the planned participation of the UTSI aircraft in the October field study, FRD is developing flight patterns for sampling the tracer plume. Aircraft sampling can be a challenge in tracer studies, because the constant movement of the aircraft precludes the collection of time-averaged concentrations at fixed points. The planned flight pattern includes crosswind legs at downwind distances ranging between 400 and 3200 m and altitudes from 100 to 500 m above the ground. An along-wind leg near the plume centerline may also be included. (FRD Staff)

Flux Measurements

Progress was made on a study involving the measurement of carbon dioxide and water vapor fluxes from an arid shrub-steppe ecosystem at the INL. This is a multi-year study that is ongoing. Preliminary results have now been completed for the years 2007-2010. (dennis.finn@noaa.gov)

ARL Convective Initiation Project

ARL has begun a study of convective initiation as a result of supplemental funding received in the aftermath of Hurricane Sandy. The study will include two field experiments in 2014 and 2015. Multiple ARL divisions are involved in the effort. FRD's participation will focus on improvements to forecast model parameterizations of surface fluxes and the planetary boundary layer. Convective initiation can be sensitive to horizontal variations in surface characteristics and the effects that these variations have on boundary-layer development. A post-doctoral researcher located at ARL Headquarters will also be involved in the parameterization improvements. ARL's work on convective initiation will be coordinated with other OAR laboratories that have related research efforts. (richard.eckman@noaa.gov)

Wind Forecast Improvement Project (WFIP)

FRD has started an analysis of wind data collected at three sites in Texas during WFIP, a wind-energy study sponsored by the Department of Energy. The WFIP observations included surface fluxes from sonic anemometers and wind profiles up to about 200 m above the ground from collocated sodars. One issue that had to be addressed was determining reasonable estimates of roughness lengths and displacement heights at the sites. There were difficulties in obtaining such estimates from the available data, so a probabilistic regression technique was developed to provide both mean values and uncertainties about the means. Flux data from the sonics were then used to examine the wind profiles as a function of atmospheric stability and compare the observed profiles with expected profiles from boundary-layer theory. (richard.eckman@noaa.gov, Dennis Finn)

NOAA/IDAHO NATIONAL LABORATORY (INL) METEOROLOGICAL RESEARCH PARTNERSHIP

INLViz, MIDFF, HYSPLIT, and Viz+

A new computer program for displaying NOAA/INL Mesonet data has been developed and delivered to various interested parties at the INL. The program is called Viz+ (pronounced viz plus) in a nod to the previous meteorological display program called INLViz. INLViz is a Windows 3.1 based program which is now several years in obsolescence. INLViz provided two separate programs in one visualization tool: 1) the display of meteorological data from the NOAA/INL Mesonet, and 2) the display of dispersion plumes from the NOAA MDIFF dispersion model. The MDIFF dispersion model was replaced by the NOAA HYSPLIT dispersion model and display system and has now been in use for about a year in the EOC. The HYSPLIT system made the

dispersion plume display portion of INLViz unneeded. With the advent of Viz+, the meteorological display of INLViz is now unneeded and plans are proceeding to decommission INLViz.

Viz+ contains nearly all of the features of the meteorological display portion of INLViz and a host of other enhancements. It is based on Google Maps, so the map display portion of Viz+ can be easily zoomed and panned. In addition to maps and terrain displays, an aerial photographic background can also be selected. Viz+ includes the ability to graph the various meteorological variables in addition to providing a text listing of the data. A table of daily averages or totals of the meteorological variables is also included. Other enhancements are planned or are underway, such as drawing a circular exclusion zone around a selected point on the map. Suggestions for additional features and capabilities are encouraged and will be incorporated as time and software capabilities permit. Plans to port the program to iPad and Android mobile devices are being formulated.

A Viz+ demonstration was presented to the INL Emergency Managers Work Group on June 27. At that meeting it was unanimously agreed to sunset INLViz on September 30, 2013. Viz+ can be downloaded and installed on any Windows or Mac PC by visiting <http://www.noaa.inel.gov/mvp/update>. A link to the download site is provided on our home and NOAA/INL Weather Center (NIWC) web pages.

Emergency Operations Center (EOC)

Four requests to provide canned weather for INL emergency response exercises were received during the quarter. The requests were for exercises on May 14, July 10, August 16, and August 24. Files containing the requested weather conditions must be created, reviewed, and then made available so the displays and modeling systems used in the Emergency Operations Center may access and display them. Three sets have been completed and the fourth is under development.

A dress rehearsal for the Annual INL exercise was conducted at the EOC on May 14th. A NOAA dispersion meteorologist participated. The drill centered on an explosion at SMC. The chemical of concern during the drill was the release of Amercor. Nowcasts and short term forecasts were issued. Several ALOHA model runs were conducted during the drill.

A NOAA dispersion meteorologist assigned to EOC Team C participated in a drill at the EOC on May 21st. This drill featured a lightning strike at the MFC complex that below open a cargo container and created a rubbish fire in a compromised barrel. The barrel contained very low levels of transuranic waste. Simulated weather was used. No dispersion model runs were needed during the drill.

A NOAA dispersion meteorologist associated with EOC Team D participated in a drill at the EOC on June 12th. This drill centered on a small explosion of dust from plant material at the Energy Systems Laboratory. Nowcasts and a short term forecast were issued. No dispersion model runs were needed during the drill.

INL Hazardous Weather Alert System

The NOAA/INL Weather Center issued 17 hazardous weather statements in the reporting quarter. Twelve of the statements were issued due to high winds (sustained winds above 25 mph) and the other 5 statements were issued due to lightning on or encroaching the INL site.

NOAA/INL Mesonet

A number of changes have been made to the NOAA/INL Mesonet this quarter. After June 30, one second measurements of air temperature minimums and maximums at all mesonet stations were discontinued. These have been replaced by one minute average air temperature minimums and

maximums to more closely correspond to National Weather Service and World Meteorological Organization standard practices. We have also added 45 m air temperatures levels to the three tall towers, updated the naming conventions for some data fields in the database, and prepared the system to collect data from an air temperature aspirator fan speed monitor. This fan speed monitor will be installed at three mesonet stations for testing this summer.

Six of the stations in the NOAA/INL Mesonet are known as Community Monitoring Stations because they are located in public locations and have attached data displays. Two of the community stations have been located at local schools as part of an outreach program funded by the Department of Energy. However, outreach funding for these two stations ended in December 2012. One of the towers, located in the city of Rexburg, ID is not critical to the Mesonet because another tower (Sugar City) is situated nearby and is at a better location. FRD is therefore in the process of deactivating the Rexburg tower. The second community tower in Blackfoot, ID is critical to the Mesonet, but the current school location is not ideal due to nearby obstructions. No existing station is located nearby that would permit us to immediately discontinue its use. FRD is considering moving this tower to a better location.

Dispersion Modeling for the Annual Site Environmental Report

A series of dispersion model runs using data from calendar year 2012 were completed for inclusion in the 2012 INL Site Environmental Report. Output from the runs are used for the required annual report on potential off-site exposure to radiological emissions from the INL. The older MDIFF puff model is still used for these annual estimates. In the future FRD would like to use the HYSPLIT model for these annual estimates, but the transition would require a significant effort and coordination with the INL contractors.

OTHER ACTIVITIES

Safety

At the April staff meeting, employees were shown the location of first aid kits, snake bite kit, and AED in the GSA vehicles. There was also a brief discussion about off-site emergencies.

Videos provided by FEMA on Cooking Fire Safety were viewed during the May staff meeting.

The staff participated in the Bike to Work program thru the Bonneville Metropolitan Planning Organization. NOAA took first place with a total of 446 miles ridden during the month of May. Richard Eckman was the top rider with 262 miles.

A fire and SIP drill was conducted on May 28, 2013. Since our building doesn't have an emergency alarm system, the employees have in the past been alerted to the emergency by air horns. However, the horns were not reliable and at times were difficult to use. This year a whistle was used to alert employees, which proved to be more effective than the horns.

A YouTube video on Food Safety After a Power Outage by the FDA was viewed at the June staff meeting.

Training

Donna Davis registered for the Administrative Professional Certificate Program. This learning plan provides advanced administrative professional courses that extend the basics to include progressive topics and intermediate technical skills. The program requires the completion of 15 online courses; Donna completed two of the courses in May.

Kirk Clawson and Donna Davis completed their annual GSA Purchase/Travel Card training, Section 508 training, ethics training, and property custodian and accountability officer training in June.

On June 12, Donna Davis participated in the 2013 Healthy Teams – Cultural Competence webinar. The webinar covered processes of intervening on assumptions and culture lens (how you see the world).

Travel

Kirk Clawson gave a presentation at the 2013 EMI SIG Annual Meeting in Chicago May 3 – 9, 2013.

While in the area on vacation, Kirk Clawson visited ARL Headquarters in College Park, Maryland on June 3, 2013.